

Original

Alternative to Total Pelvic Exenteration in Locally Advanced Rectal Cancer: *En Bloc* Radical Prostatectomy

Leonaldson Castro, MD, PhD, TCBC, TSBCO, FACS¹; Rubens Kesley, MD, PhD, TSBCO, FACS¹; José Humberto Correa, MD, MSc, TCBC, TSBCO, FACS¹; Gustavo Stoduto, MD¹; Aldo Barros, MD¹; Audrey Tsunoda, MD²

1-Serviço de Cirurgia Abdominopélvica do Instituto Nacional de Câncer/MS-RJ.

2- Former Surgical Oncology resident from Brazilian National Cancer Institute and surgeon from Barretos Cancer Hospital.

Abstract

Total pelvic exenteration (TPE) represents the latest frontier of possible resection for primary pelvic tumors or recurrence of antero-central growth in the pelvis. At INCA, less than 50% of advanced rectal tumors that necessitated TPE presented vesical invasion. As a consequence, to avoid urinary sequelae in the treatment of tumors of advanced extraperitoneal rectum (cT4 – prostate) or in synchronous carcinomas of the rectum and prostate, en bloc radical prostatectomy (EBRP) was performed in selected patients. Objective: In this study we present the results of EBRP, emphasizing its technical feasibility and validating it as an option for the treatment of advanced pelvic tumors. Material and Method: A database review was made with prospective registration of patients who had undergone EBRP at INCA between January 2001 and May 2007. Results: Six patients were eligible for EBRP with a mean age of 57 years (range, 33 to 78). Of these, five presented extraperitoneal rectal adenocarcinoma submitted to neoadjuvant chemoradiation and one synchronous rectal adenocarcinoma to recurrence of prostate cancer, treated previously with interstitial brachytherapy. En bloc prostatectomy with neural preservation together with rectal resection was performed in all cases. When there was safe distal clearance margin for anal sphincter preservation, anterior resection of the rectum and ileo-rectal anastomosis were performed (n = 2), otherwise, there was rectal abdominoperineal amputation. Urethrovessical anastomosis was not possible in two cases due to extensive urethra compromise, which required permanent cystostomy. In the other cases, urinary reconstruction was performed through primary urethrovessical anastomosis. There were two urinary fistulae, one of which necessitated a temporary bilateral percutaneous nephrostomy. There was no perioperative death. The mean disease-free survival was 20.3 months (range, 4 to 48) and only one patient presented local recurrence after 7 months. The mean follow-up time was 28 months (range, 15 to 48). Conclusion: The en bloc resection of the prostate and rectum is a feasible surgical technique, associated with better quality of life of patients and does not compromise the oncologic prognosis in comparison to TPE.

Keywords: Pelvic Exenteration. Prostatectomy. Rectal Cancer. Pelvic Neoplasms. Prostate Neoplasms.

Introduction

TPE is an exceptionally complex and challenging surgical procedure, indicated as the latest frontier for the surgical treatment of locally advanced rectal cancer with prostate, seminal vesicle and vesical funneling invasion, primary or recurring. In this context, the *en-bloc* removal of the rectum, bladder, distal ureters and reproductive organs can be performed with curative intent. However, outcomes in relevant morbidities and pelvic morphofunctional alterations frequently determine the need of two stomas, one for urinary diversion, either through intestinal segments or cutaneous ureterostomy,

and the other for fecal diversion, irreversibly modifying the patient's way of life.

According to analysis of 60 TPEs performed at the Brazilian National Institute of Cancer (INCA) in the treatment of patients with rectal adenocarcinoma, neoplastic invasion of the bladder was observed in only 58% of monobloc surgeries. Furthermore, urinary diversion after total cystectomy, inherent to TPE, in the long run can determine the occurrence of urinary

Correspondence

Leonaldson Castro

Condomínio Vale de Itaipu, Rua 02, Casa 220

24340-140-Niterói- Rio de Janeiro

Email: leonaldson@gmail.com

obstruction and chronic renal insufficiency due to prevalent stenosis of ureterointestinal anastomosis. Thus, in order to avoid these urinary sequelae and succeeded in preoperatively excluding vesical compromise with current high-resolution pelvic image exams (nuclear magnetic resonance enables highly accurately definition of clinical staging), EBRP can be performed in selected patients with ARE T4 (prostate) and ultimately, with indication extrapolated to treat synchronous adenocarcinomas of the rectum and prostate with the intention maintained radically by surgery, to improve morbidity and quality of life results.

In this study, we evaluate the oncologic and functional outcomes of patients undergoing EBRP, emphasizing its technical feasibility and validating it as an option for the treatment of advanced pelvic tumors.

Methods

A database review was made with prospective registration of patients with locally advanced rectal tumors with prostate tumor invasion or synchronous rectal and metastatic prostate without metastatic disease, submitted to EBRP in the Abdominopelvic Surgery service of INCA between January 2001 and May 2007.

All patients underwent rectal resection, with or without sphincteric preservation, plus radical prostatectomy with neural preservation and bladder-sparing surgery. Surgical specimens were examined macro- and microscopically to determine the status of distal and radial surgical margins, in addition to the lymph nodes. Perioperative frozen section biopsies were performed for the certification of R0 radical surgery, which was obtained in all cases.

Surgical Technique

Through median laparotomic access and in the absence of metastatic disease, the medial mobilization of the left colon and release of splenic angle was performed. The inferior mesenteric artery was ligated at its aortic origin. The rectum is laterally and posteriorly dissected with total mesorectal excision up to the pelvic floor musculature. Anteriorly, through a peritoneal incision until the vesicorectal reflection, a plan of dissection for the visualization of the seminal vesicles is developed (Figure 1). If no bladder compromise by tumor involvement is established, the indication of prostatectomy is confirmed.

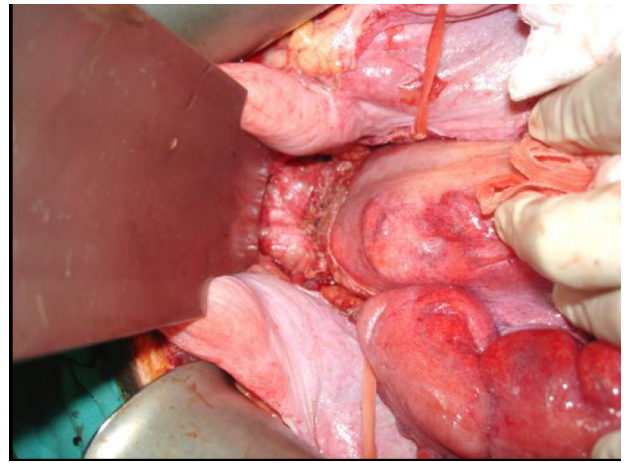


Figure 1 - Operative field evidencing extraperitoneal rectal tumor with isolated seminal vesicle and prostate invasion.

The dissection of Retzius' space is made until the endopelvic fascia, in which the incision, following the ligation and the section of the penile dorsal venous plexus, conforms to the classical technique of radical prostatectomy with neural preservation. The prostate is dissected laterally with distal section to the bladder neck and proximal to the membranous urethra (Figure 2). The perineal or abdominoperineal intersphincteric approach,

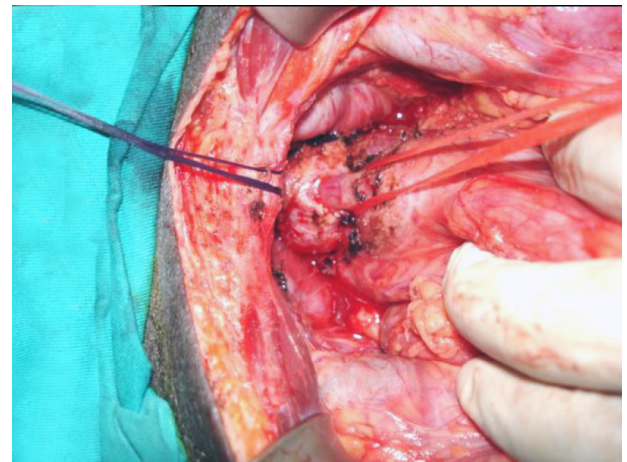


Figure 2 - En bloc resection of prostate and rectum. Bladder neck (cardiac tape) and distal urethra (polyglactin sutures) were

with *en bloc* resection of the rectum with the prostate and seminal vesicles, is opted for when the bladder and membranous urethra are preserved. The specimen is submitted to perioperative evaluation of surgical margins (Figure 4). Urinary track reconstruction is made through cystourethral anastomosis (Figure 3) and the fecal pathway with ileo-rectal anastomosis with stoma protector or permanent terminal colostomy. When the membranous urethra is additionally resected due to tumor involvement, permanent cystostomy is opted for.

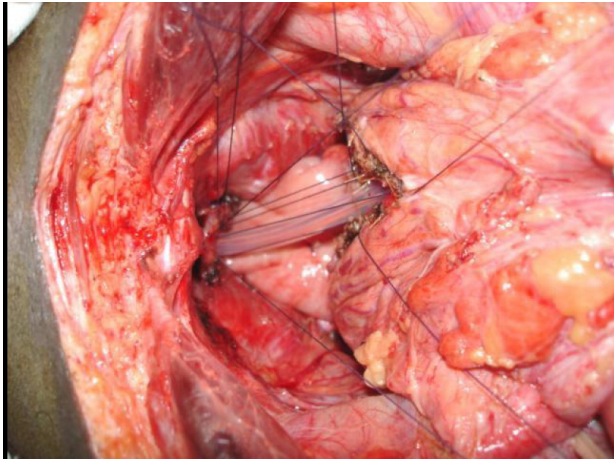


Figure 3 - Surgical field showing urethrovesical anastomosis and, in posterior plane, the attached stoma appliance.

Results

Among patients treated for rectal cancer at INCA, six were eligible for EBRP, with a mean age of 57 years (33 to 78). Of these, five presented extraperineal rectal adenocarcinoma submitted to neoadjuvant chemoradiation and one synchronous rectal adenocarcinoma to recurrence of prostate cancer, treated previously with interstitial brachytherapy. *En bloc* prostatectomy with neural preservation together with rectal resection was performed in all cases (Figures 4 and 5). Anterior resection of the rectum and ileo-rectal anastomosis was performed in two cases and rectal abdominoperineal amputation in four. Urethrovesical anastomosis was not possible in two cases due to extensive urethra compromise, which



Figure 4 - Radical prostatectomy specimen with vesical probe in prostatic urethra.

required permanent cystostomy. In the other cases, urinary reconstruction was performed through primary urethrovesical anastomosis (Figures 3 and 6). There were two urinary fistulae, one of which necessitated a temporary bilateral percutaneous nephrostomy. There



Figure 5 - Specimen of prostatectomy open to evaluate prostate infiltration (arrow).

was no perioperative death and surgical morbidity was 50%. In all cases, the prostate presented neoplastic compromise. In the case of synchronous tumor resection, there were two primary tumors (prostate and rectum). All



Figure 6 - Voiding urethrocytography in patient who had undergone prostatectomy (Absence of urinary fistula).

patients were submitted to R0 resection. The mean disease-free survival was 20.3 months (range, 4 to 48). Only one patient who underwent the anal sphincter preservation procedure presented local recurrence (submucous) along the pectineal line with seven months of follow-up, despite the prior surgical specimen presenting 2.0 cm distal margins free of tumor. As an exceptional course of treatment, local transanal resection was performed and corresponding additional tele-radiotherapy. The patient evolved with new local recurrence after 12 months and death in 25 months of follow-up.

After an average follow-up time of 28 months (range, 15 to 48), 3 patients were alive, 2 without evidence of disease and 1 presented recurrence at distance in 2 sites (liver and lung), who underwent hepatic resection and currently in

preoperative stages for pulmonary resection. Two patients evolved to death due to metastatic disease (lung).

Discussion

In the 1960s, the possibility to perform a prostatectomy, and at the same time a rectal abdominoperineal amputation with the goal of preventing postoperative urinary retention, was first suggested.¹ With

the understanding of pelvic anatomy and physiology, this procedure remained without precise indication until 1993, when Campbell and collaborators suggested a restorative prostatectomy for patients with rectal neoplasm with invasion restricted to the prostate or seminal vesicles.² Few descriptions followed in the literature, totaling 13 cases of rectal cancer and 3 synchronous tumors of the rectum and prostate.³⁻⁷

In the experience of Norwegian surgeons, half of the patients undergoing PT presented urinary fistula.⁸ In this study, the rate of urinary fistula was 33%; however,

Table 1 - Prostatectomy at INCA

P	Age (years)	Primary Tumor	Surgery	Anal sphincter preservation	Time of hospitalization (d)	Complications	DFS*(m)/	SV** (m)	Present status
		synchronous				Postoperative	Reoccurrence location		
1	49	Rectum	PT + urethrovessical anastomosis 12/13/2001	no	52	Urinary fistula Pneumonia	10/Lung, Subcutaneous	12	Death 11/29/2002
2	78	Rectum+ prostate	PT + urethrovessical anastomosis 4/6/2006	no	24	Urinary fistula	26/Liver, lung	40	WED
3	69	Rectum+ Kidney	PT with cystostomy + radical nephrectomy 8/18/2005	no	15	no	48	48	NED
4	53	Rectum	PT + urethrovessical anastomosis + ileo-retal 5/15/2007	yes		no	27	27	NED
5	33	Rectum	PT + urethrovessical anastomosis + ileo-retal 9/15/2005	yes	13	no	7/location (anastomosis)	25	Death 10/17/2007
6	61	Rectum	PT with cystostomy 1/13/2005	no	26	Pelvipерitoneal	4/Lung	15	Death 4/27/2006

*DFS=Disease-Free Survival

**SV=Survival

NED= No Evidence of Disease

WED= With Evidence of Disease

Table 2- Patients and Surgical Procedures

Patient	Age (years)	Tumor (location)	Surgery	Reconstruction	Urinary	Fecal
1	49	Rectum	APR + RP	UVA	No	
2	78	Rectum + Prostate	APR + RP	UVA	No	
3	69	Rectum + Kidney	APR + RP + RN	CTT	No	
4	53	Rectum	APR + RP	UVA	Yes	
5	33	Rectum	APR + RP	UVA	Yes	
6	61	Rectum	APR + RP	CTT	No	

ARR: Anterior rectal resection
RP: Radical prostatectomy
UVA: Urethrovessical anastomosis

APR: Abdominoperineal resection
RN: Radical nephrectomy
CTT: Cystostomy

Table 3- Survival

Patient	DFS	Reoccurrence location	Survival	Urinary incontinence	Status
1	10	Lung	12	Yes	Death
2	26	Liver + lung	40	No	Alive, WED
3	48	-	48	NA	Alive, NED
4	27	-	27	Yes	Alive, NED
5	07	Location	25	Yes	Death
6	04	Lung	15	NA	Death

DFS: Disease-free survival ; WED: With evidence of disease ; NED: No evidence of disease

with a benign course in both cases, without mortality or subsequent need of reoperations. We believe that in the absence of the rectum after prostatectomy in a previously irradiated patient, the healing of the urethrovesical anastomosis becomes more difficult.

In four patients, in whom urinary reconstruction was possible, only one presented clinically relevant urinary incontinence (synchronous rectal and prostate adenocarcinoma). None of the six patients presented renal dysfunction during follow-up.

In the single case of local recurrence, this occurred in a patient with anal sphincter preservation, distal clearance margin of surgical specimen was free and adequate (2.0 cm), and in its exceptional rescue through local excision, this recurrent lesion was restricted to the deep submucosa (sm3), suggesting that this recurrence was independent of the bladder-sparing surgery and more likely, a phenomenon of submucous skip metastases. It is important to note that all cases had R0 resection and that there was no recurrence in the urinary tract, corroborating that bladder-sparing surgery did not interfere with the radicalism nor with oncologic principles in these selected patients. Nonetheless, we consider a greater number of cases selected for study and follow-up are needed to confirm these good oncologic results.

Conclusions

En bloc resection of the prostate with the seminal vesicles and the rectum is a feasible surgical technique, associated with better quality of life of these patients

because it preserves the urinary function and avoids the relevant secondary morbidities of urinary derivations with intestinal tubes, in addition to not compromising the oncologic prognosis of tumor resection in comparison to TPE.

References:

1. Holund T. Routine prostatectomy in association with amputation of the rectum. *Ugeskr Laeger*. 1966; 128:502.
2. Campbell SC, Church JM, Fazio VW, Klein EA, Pontes JE. Combined radical retropubic prostatectomy and proctosigmoidectomy for en bloc removal of locally invasive carcinoma of the rectum. *Surg Gynecol Obstet*. 1993; 176:605-8.
3. Balbay MD, Slaton JW, Trane N, Skibber J, Dinney CPN. Rationale for bladder-sparing surgery in patients with locally advanced colorectal carcinoma. *Cancer*. 1999; 86:2212-6.
4. Fujisawa M, Nakamura T, Ohno M, Miyazaki J, Arakawa S, Haragushi T, et al. Surgical management of the urinary tract in patients with locally advanced colorectal cancer. *Urology*. 2002; 60:983-7.
5. Wigg JN, Waehre H, Larsen SG, Braendengen M, Giercksky KE. Radical prostatectomy for locally advanced primary or recurrent rectal cancer. *EJSO*. 2003; 29:455-8.
6. Herranz Amo F, Muñoz Jiménez F, Subira Rios D, Gomez Espi M, Calvo Manuel FA. Preservation of the bladder in rectal cancer with prostatic invasion. *Actas Urol Esp*. 2004; 28:447-51.
7. Klee LW, Grmoljez P. Combined radical retropubic prostatectomy and rectal resection. *Urology*. 1999; 54:679-81.
8. Wiig JN, Poulsen JP, Larsen SG, Braendengen M, Waehre H, Giercksky KE. Total pelvic exenteration with preoperative irradiation for advanced primary and recurrent rectal cancer. *Eur J Surg*. 2002; 168:42-8.

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